

A pilot study of Alexa for autonomous second language learning

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Abstract. Although initial research involving Intelligent Personal Assistants (IPAs) for language learning have yielded promising results, no study has examined their use in the context of Autonomous Second Language Learning (ASLL). Thus, the main goal of this pilot study was to investigate the use of an IPA, specifically Alexa, for ASLL. Two Japanese university second language (L2) English students participated in a four-week study, which involved the learners interacting with Alexa through the Echo Dot speaker in their respective homes. Learner usage data was collected via the Alexa website and the students' attitudes toward the IPA for ASLL were evaluated through a survey consisting of 12 Likert-scale items and four open-ended questions. It was found that while the L2 students had positive opinions toward the use of Alexa for ASLL, the learners did not make active use of the technology.

Keywords: intelligent personal assistants, autonomous language learning, L2 pronunciation, L2 speaking.

1. Introduction

While much of the focus on language teaching and research revolves around what happens in the classroom, what goes on outside the classroom is equally as important (Richards, 2015). Consequently, there has been a rise in the use of Computer-assisted Language Learning (CALL) to support ASLL. As Richards (2015) notes, the use of technology can “provide greater opportunities for meaningful and authentic language use than are available in the classroom” (p. 6). Considering this, IPAs may be potentially useful since they provide opportunities for L2 input and output. While initial studies have resulted in positive findings,

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they were either feasibility studies which investigated the ability of IPAs to understand L2 speech (Dizon, 2017; Moussalli & Cardoso, 2016), or research centered on finding ways to use virtual assistants for classroom-based language learning (Underwood, 2017). No study has examined IPAs to promote ASLL; therefore, this case-study investigated the use of Alexa, a virtual assistant by Amazon, to support ASLL for two Japanese university students. Accordingly, the following research questions were addressed in the study; (1) to what extent do L2 learners use Alexa for ASLL?; (2) how do they use the IPA?; and (3) what are their views of Alexa for ASLL?

2. Method

2.1. Participants

Two fourth-year students at a Japanese university, who were selected based on volunteer sampling, agreed to participate in the pilot study and provided written informed consent. It is also important to note that it was clearly stressed to each participant that all commands given to Alexa would be stored in the cloud and accessed by the researchers. The learners had Test of English for International Communication (TOEIC) scores ranging from 720-770, which is equivalent to B1 on the Common European Framework of Reference for languages (CEFR) scale. Students were given a second generation Echo Dot, a smart speaker which features Alexa, and were allowed to use the device for four weeks from December 2018 to January 2019. A tutorial was given to familiarize the learners with the device because they had no prior experience with the smart speaker or Alexa.

2.2. Data collection and analysis

A mixed method case-study design was implemented to examine the use of Alexa for ASLL. Learner usage data was collected through the history page on the Alexa website, which lists all commands given to the IPA over the four-week intervention in text and audio form. Qualitative data concerning the students' attitudes toward Alexa for ASLL was obtained via two methods: a 12-item survey using a five point Likert-scale (strongly disagree=1 and strongly agree=5) adapted from Chen (2013), which examined three technology acceptance model variables (usefulness, effectiveness, and satisfaction), as well as four open-ended writing questions adapted from Lee (2011), which were explicitly designed to elicit responses related to autonomous learning.

Data concerning the learners' usage of Alexa was broken down into the types of commands given, as well as the frequency in which they were given. Mean and standard deviation (SD) values for each survey construct were provided. Lastly, the written responses were analyzed and thematically organized according to Hubbard's (2009) framework, which looks at how CALL can affect language learning through multiple perspectives.

3. Results and discussion

As shown in Table 1, the commands given were divided into eight different categories according to grounded theory. As outlined by Charmaz (1996), codes were developed based on the command data and these codes were arranged into categories. Music commands were the most commonly used type, which is unsurprising given the popularity of English music. More surprising, however, was the fact that commands related to getting to know Alexa were the second most frequent. This suggests that the students enjoyed having dialogues with Alexa, which links to one of the identified themes based on the students' written comments (see below). Nevertheless, Alexa was not used frequently by the learners over the four-week study. In fact, they only gave a total of 81 commands over the course of the intervention. One possible reason for this is the time of the year in which the students were given their Echos, which was over the New Year's break and end of the semester. Therefore, the students could have been too busy with holiday-related gatherings as well as studying for exams to use the IPA.

Table 1. Types and frequency of commands given

Command type	Command example	No.	%
Music	Play Taylor Swift 'Stay Stay Stay'	22	27.2%
Getting to know Alexa	Do you have any brothers or sisters?	13	16.0%
Humor	Tell me a joke.	11	13.6%
General info	What's the weather tomorrow?	10	12.3%
Language	How do you say good morning in Russian?	7	8.6%
News	What's my flash briefing?	7	8.6%
Story	Tell me a story.	6	7.4%
Other	Set an alarm for me.	6	6.2%
Total		81	100%

Table 2 depicts the mean results for each construct that was examined through the questionnaire. The students' responses indicate that they had favorable views of using Alexa for ASLL. In particular, both usability and satisfaction received mean

totals of four, which indicates agreement with the statements. Therefore, it can be concluded that the learners believed the IPA was easy to use and that they enjoyed interacting with it for ASLL.

Table 2. Alexa survey results

Construct	M	SD
Usability	4.0	0.0
Effectiveness	3.8	0.3
Satisfaction	4.0	0.5

As Table 3 illustrates, three themes from Hubbard (2009) were identified from the students’ written responses: (1) better *access* to dialogue in the L2; (2) improved *learning efficiency* through indirect pronunciation feedback; and (3) enhanced *learning effectiveness* through a promotion of self-awareness of gaps in the L2.

Table 3. Students’ written responses

Theme	Student comments
Access – Better access to dialogue in the L2	S1: I asked many things that Alexa like a human such as ‘What are you doing?’ and ‘How old are you?’, because I wanted to get interesting answers. S2: I think the most interesting thing was having dialogue with Alexa, especially after I downloaded the Alexa app and its introductions helped me create better conversations with Alexa.
Learner efficiency – Improved learning efficiency through indirect pronunciation feedback	S1: By asking something in English, I could know my pronunciations were understandable or not for native speakers. S2: Alexa was like a real person who was having conversations with me... For example, it reminded me to pronounce correctly when I tried to give Alexa commands in English.
Learning effectiveness – Enhanced learning effectiveness through a promotion of self-awareness of gaps in the L2	S1: I couldn’t pronounce some words correctly or find appropriate grammar though I’ve known enough knowledge. S2: I found the most difficult thing was talking to Alexa with a foreign accent could make Alexa misunderstand my commands.

These results further illustrate that the students had favorable opinions toward Alexa for ASLL. Particularly, they highlight the potential for IPAs to be used

as simulated conversation partners to improve L2 speaking skills, especially pronunciation, which is significant given that many L2 learners lack speaking opportunities outside of class.

4. Conclusion

To sum up, although the L2 students did not interact with Alexa frequently, they did have positive perceptions toward its use for ASLL, which supports past positive findings on the use of virtual assistants in L2 contexts (Dizon, 2017; Moussalli & Cardoso, 2016; Underwood, 2017). Of particular importance are the learners' comments that indicated that the IPA could support L2 dialogue and pronunciation development. This is significant as many L2 learners, especially those in foreign language contexts, have few opportunities to use the target language in a productive and meaningful way. While this pilot study is obviously limited by its small sample size, it highlights the potential of IPAs such as Alexa to support ASLL due to the affordances they provide for L2 listening and speaking. Thus, future research ought to incorporate a greater number of participants from a variety of linguistic backgrounds to discover how IPAs can promote L2 development, especially in terms of languages other than English.

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